

ROUND 7

TOSS-UP

1) PHYSICAL SCIENCE *Multiple Choice* If you stick a thermometer into a frozen slurry of lemonade as it is melting, you will find that the reading on the thermometer is:

- W) Slowly falling
- X) Not changing, as long as there is ice
- Y) Slowly rising
- Z) Quickly rising

ANSWER: X) NOT CHANGING, AS LONG AS THERE IS ICE

BONUS

1) PHYSICAL SCIENCE *Short Answer* At incredibly low temperatures near 0 Kelvin, atoms coalesce into what substance?

ANSWER: BOSE-EINSTEIN CONDENSATE

TOSS-UP

2) GENERAL SCIENCE *Multiple Choice* Which of the following is an example of an igneous (read as: IG-nee-ehs) rock?

- W) Flint
- X) Obsidian (read as: ohb-SI-dee-ahn)
- Y) Anthracite (read as: AN-thrah-syt)
- Z) Chalk

ANSWER: X) OBSIDIAN

BONUS

2) GENERAL SCIENCE *Multiple Choice* You discover an igneous (read as: IG-nee-ehs) rock with a coarse-grained texture and the appearance of a mass of intergrown crystals of similar size. At which of the following locations did magma most likely solidify?

- W) In the ocean
- X) On the surface
- Y) Far below the surface
- Z) No more than 100 feet below the surface

ANSWER: Y) FAR BELOW THE SURFACE

TOSS-UP

3) LIFE SCIENCE *Multiple Choice* Which of the following best explains why most food chains have fewer than five organisms in them?

- W) Energy is too complex to cycle through multiple steps
- X) The amount of energy at the producer level can only support a limited number of consumers
- Y) There is only enough room on Earth for a certain number of animals, and they are divided into food chains
- Z) Ecosystems can only support a certain number of organisms, and they are divided into food chains

ANSWER: X) THE AMOUNT OF ENERGY AT THE PRODUCER LEVEL CAN ONLY SUPPORT A LIMITED NUMBER OF CONSUMERS

BONUS

3) LIFE SCIENCE *Multiple Choice* An organism's way of life, including its habitat, food, predators, and other organisms it competes with for resources make up an organism's:

- W) Ecosystem
- X) Niche
- Y) Biome
- Z) Food pyramid

ANSWER: X) NICHE

TOSS-UP

4) EARTH AND SPACE SCIENCE *Multiple Choice* If convection currents in the mantle stopped, which of the following would likely happen?

- W) The number of earthquakes would increase
- X) The number of earthquakes would stay the same
- Y) Earthquakes would get stronger
- Z) The number of earthquakes would decrease

ANSWER: Z) THE NUMBER OF EARTHQUAKES WOULD DECREASE

BONUS

4) EARTH AND SPACE SCIENCE *Short Answer* In what state of matter are convection currents unable to transfer heat?

ANSWER: SOLID

TOSS-UP

5) GENERAL SCIENCE *Short Answer* Name the rigid segments into which the Earth's crust is divided.

ANSWER: PLATES (ACCEPT: TECTONIC PLATES)

BONUS

5) GENERAL SCIENCE *Multiple Choice* The Earth's crust accounts for about what percentage of the Earth's volume?

- W) 1%
- X) 5%
- Y) 10%
- Z) 15%

ANSWER: W) 1%

TOSS-UP

6) ENERGY *Short Answer* If the temperature change of a pot of water is 180 Kelvin, what is the temperature change in degrees Celsius?

ANSWER: 180

BONUS

6) ENERGY *Multiple Choice* Which of the following household appliances uses the least amount of energy over the course of a year?

- W) Refrigerator
- X) Water heater
- Y) Air conditioner
- Z) Dishwasher

ANSWER: Z) DISHWASHER

TOSS-UP

7) GENERAL SCIENCE *Short Answer* What is the name for the vector quantity defined as the rate of change of position?

ANSWER: VELOCITY

BONUS

7) GENERAL SCIENCE *Short Answer* In 12 seconds, a car goes from 0 to 60 miles per hour. In miles per hour per second, what is its average rate of acceleration?

ANSWER: 5

TOSS-UP

8) PHYSICAL SCIENCE *Short Answer* An ice cube is placed in a perfectly insulated box with an air temperature of 60° Fahrenheit and covered. Sometime later, the box is opened and the ice cube has completely melted. How will the air temperature in the box have changed?

ANSWER: IT WILL BE LOWER

BONUS

8) Physical SCIENCE *Short Answer* According to the laws of entropy, all useful forms of energy are converted into what form of energy?

ANSWER: HEAT

TOSS-UP

9) EARTH AND SPACE SCIENCE *Multiple Choice* Shortly after its formation, Earth's moon was:

- W) Closer to Earth than it is now
- X) Farther from Earth than it is now
- Y) The same distance from Earth as it is now
- Z) Oscillating between further from and closer to Earth

ANSWER: W) CLOSER TO EARTH THAN IT IS NOW

BONUS

9) EARTH AND SPACE SCIENCE *Multiple Choice* What rock type would you not expect to find on the Moon?

- W) Rock similar in composition to Earth's mantle
- X) Layered sedimentary rock
- Y) Igneous (read as: IG-nee-ehs) rock
- Z) Rock similar in composition to a metallic meteor

ANSWER: X) LAYERED SEDIMENTARY ROCK

TOSS-UP

10) MATH *Short Answer* What is the coefficient of x in $10y - 6x + 13$?

ANSWER: -6

BONUS

10) MATH *Multiple Choice* Where is the geometric center of a cube?

- W) It is at the center of its face
- X) It is at the vertex of two faces
- Y) It is at the point of intersection of the diagonals of a face
- Z) It is at the point of intersection of the cube's diagonals

ANSWER: Z) IT IS AT THE POINT OF INTERSECTION OF THE CUBE'S DIAGONALS

TOSS-UP

11) PHYSICAL SCIENCE *Multiple Choice* Which of the following substances is likely to be the most reactive in water?

- W) Sodium
- X) Mercury
- Y) Aluminum
- Z) Gold

ANSWER: W) SODIUM

BONUS

11) PHYSICAL SCIENCE *Multiple Choice* The reactivity of an element depends predominantly on its:

- W) Atomic mass
- X) Valence electron configuration
- Y) Electronegativity
- Z) Relative abundance

ANSWER: X) VALENCE ELECTRON CONFIGURATION

TOSS-UP

12) LIFE SCIENCE *Short Answer* Glucose is the main source of energy for most animals. What form of energy is glucose?

ANSWER: CHEMICAL (ACCEPT: FOOD)

BONUS

12) LIFE SCIENCE *Multiple Choice* Which of the following organisms is considered to be a crustacean?

- W) Jellyfish
- X) Diatom
- Y) Copepod
- Z) Foraminifera

ANSWER: Y) COPEPOD

TOSS-UP

13) MATH *Multiple Choice* Molly walks an average of 3 strides in 2 seconds. At this rate, how many strides can she make in 1 minute?

- W) 30
- X) 60
- Y) 90
- Z) 120

ANSWER: Y) 90

BONUS

13) MATH *Short Answer* Rectangle A has a length of 53 inches and a height of 28 inches. If rectangle B is similar to A such that the scale factor of B to A is 5 to 1, what is the perimeter of rectangle B in inches?

ANSWER: 810

TOSS-UP

14) ENERGY *Short Answer* What is the color of the lowest frequency light that is visible to humans?

ANSWER: RED

BONUS

14) ENERGY *Multiple Choice* An observer is watching a train pass. As the train approaches the observer, in what way will the frequency of the sound emanating from the train appear to change relative to the observer?

- W) It will be lower
- X) It will be higher
- Y) It varies
- Z) It will not be different

ANSWER: X) IT WILL BE HIGHER

TOSS-UP

15) PHYSICAL SCIENCE *Multiple Choice* Aria is holding a bowling ball and Robert is holding a tennis ball on the roof of their school. Aria and Robert drop these objects off the roof at the same time. Neglecting air resistance, what will happen?

- W) Aria's bowling ball will hit the ground first due to its greater mass
- X) Robert's tennis ball will hit the ground first due to its faster acceleration
- Y) The tennis ball and the bowling ball will hit the ground at the same time
- Z) The result can't be determined without knowing the ball's density

ANSWER: Y) THE TENNIS BALL AND THE BOWLING BALL WILL HIT THE GROUND AT THE SAME TIME

BONUS

15) PHYSICAL SCIENCE *Short Answer* What does the law of conservation of energy tell us about the total amount of energy in a closed system?

ANSWER: IT DOESN'T CHANGE (ACCEPT: IT IS CONSTANT)

TOSS-UP

16) MATH *Multiple Choice* Which of the following is NOT necessarily a regular polygon?

- W) Square
- X) Isosceles triangle
- Y) Octagon with all internal angles of 135°
- Z) Hexagon with all internal angles of 120°

ANSWER: X) ISOSCELES TRIANGLE

BONUS

16) MATH *Short Answer* If you double a number, then double that result, and continue that doubling process, how many times must you double a number in order to make the result greater than 10 times the original number?

ANSWER: 4

TOSS-UP

17) LIFE SCIENCE *Short Answer* Of what kingdom are yeast members?

ANSWER: FUNGI

BONUS

17) LIFE SCIENCE *Multiple Choice* Which of the following statements is NOT true about the kingdom Fungi?

- W) Fungi are more closely related to plants than animals
- X) Fungi are not dependent on light
- Y) Fungi can grow in any direction
- Z) Fungi usually reproduce by wind-disseminated spores

ANSWER: W) FUNGI ARE MORE CLOSELY RELATED TO PLANTS THAN ANIMALS

TOSS-UP

18) ENERGY *Multiple Choice* Electrical current is best conducted through which of the following substances?

- W) Copper
- X) Water
- Y) Wood
- Z) Stone

ANSWER: W) COPPER

BONUS

18) ENERGY *Multiple Choice* The presence of which of the following in the ocean best explains why electrical current is generally better conducted through the ocean than a freshwater lake.

- W) Dissolved salt
- X) Large waves
- Y) Eels
- Z) Petroleum waste from large ships

ANSWER: W) DISSOLVED SALT

TOSS-UP

19) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is NOT a fossil fuel?

- W) Oil
- X) Hydrogen gas
- Y) Natural gas
- Z) Coal

ANSWER: X) HYDROGEN GAS

BONUS

19) EARTH AND SPACE SCIENCE *Multiple Choice* Fossil fuels form through the decomposition of organic materials. You're studying a map that shows ancient environments. If you went hunting tomorrow for fossil fuels, which of these ancient habitats would you avoid?

- W) Desert
- X) Swamp
- Y) Forest
- Z) Coral reef

ANSWER: W) DESERT

TOSS-UP

20) MATH *Short Answer* Simplify (read as: one third divided by one sixth)

ANSWER: 2

BONUS

20) MATH *Short Answer* What is the fifth positive integer multiple of 252?

ANSWER: 1260

TOSS-UP

21) LIFE SCIENCE *Multiple Choice* Transgenic animals carry the genes from other species in their DNA through a deliberate modification of their genome. Which of the following phrases does NOT reflect why transgenic animals are currently being produced in the United States?

- W) To have animal models for human diseases
- X) To test the purity of human proteins (such as human insulin) used as drugs
- Y) For the production of human food
- Z) Improving animal health or productivity

ANSWER: Y) FOR THE PRODUCTION OF HUMAN FOOD

BONUS

21) LIFE SCIENCE *Multiple Choice* Which of the following issues do humans have the most control over when contemplating the release of transgenic animals into the wild?

- W) Competition between transgenic and wild populations
- X) Movement of the altered gene into the wild gene pool
- Y) Different niche requirements with the transgenic versus wild populations
- Z) Viability of transgenic fish

ANSWER: Z) VIABILITY OF TRANSGENIC FISH

TOSS-UP

22) GENERAL SCIENCE *Short Answer* How many protons does an atom of helium have?

ANSWER: 2

BONUS

22) GENERAL SCIENCE *Multiple Choice* Two isotopes of the same element differ with respect to which of the following?

- W) Number of protons
- X) Number of electrons
- Y) Number of neutrons
- Z) Atomic number

ANSWER: Y) NUMBER OF NEUTRONS

TOSS-UP

23) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following statements is true about primary producers in the ocean?

- W) They are responsible for bringing energy from the physical world into the biological world
- X) They are found primarily in tropical coral reef environments in equatorial waters
- Y) They are also referred to as primary consumers in an ecosystem model
- Z) They include sharks and large bony fishes

ANSWER: W) THEY ARE RESPONSIBLE FOR BRINGING ENERGY FROM THE PHYSICAL WORLD INTO THE BIOLOGICAL WORLD

BONUS

23) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is true about deep mid-ocean ridge ecosystems?

- W) There are no primary producers, only consumers and decomposers
- X) The organisms are highly mobile, ascending daily to the ocean surface to feed
- Y) The source of energy is chemical energy from hydrothermal vents of the seafloor
- Z) The organisms have the most dynamic and complex coloring on their bodies so they can be visible at depth

ANSWER: Y) THE SOURCE OF ENERGY IS CHEMICAL ENERGY FROM HYDROTHERMAL VENTS OF THE SEAFLOOR

TOSS-UP

24) MATH *Short Answer* The dimensions of a rectangular prism are 12 centimeters by 12 centimeters by 10 centimeters. What is its volume in cubic centimeters?

ANSWER: 1440

BONUS

24) MATH *Multiple Choice* What is the measure, in inches, of the hypotenuse of a right triangle when the other two sides measure 6 inches and 5 inches?

- W) 30
- X) $\sqrt{11}$
- Y) $\sqrt{30}$
- Z) $\sqrt{61}$

ANSWER: Z) $\sqrt{61}$

TOSS-UP

25) EARTH AND SPACE SCIENCE *Multiple Choice* Most of the photons emitted by our sun fall in which pair of ranges of the electromagnetic spectrum?

- W) Visible light and infrared
- X) Radio and X-ray
- Y) Gamma and infrared
- Z) Ultraviolet and visible

ANSWER: W) VISIBLE LIGHT AND INFRARED

BONUS

25) EARTH AND SPACE SCIENCE *Multiple Choice* Our sun is expected to last for approximately how many more years?

- W) 50 million
- X) 500 million
- Y) 5 billion
- Z) 50 billion

ANSWER: Y) 5 billion